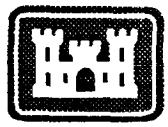

US Army Corps
of Engineers
HUNTSVILLE DIVISION

Defense Environmental Restoration Program
for
Property Owned by the Department of Defense

Ordnance and Explosive Waste
Chemical Warfare Materials

ARCHIVES SEARCH REPORT

FORT WINGATE

McKinley County, New Mexico

July 1995

Prepared by
US ARMY CORPS OF ENGINEERS
ST. LOUIS DISTRICT

ORDNANCE AND EXPLOSIVE WASTE
CHEMICAL WARFARE MATERIALS
ARCHIVES SEARCH REPORT

FORT WINGATE DEPOT ACTIVITY

McKINLEY COUNTY
GALLUP, NEW MEXICO

TABLE OF CONTENTS

ORDNANCE AND EXPLOSIVE WASTE
CHEMICAL WARFARE MATERIALS
ARCHIVES SEARCH REPORT

FORT WINGATE DEPOT ACTIVITY

McKINLEY COUNTY
GALLUP, NEW MEXICO

ALL MAPS IN SEPARATE BINDER

MAPS/DRAWINGS

M-1	Location Map
M-2	Vicinity Map
M-3	Ordnance Contamination Site Map
M-4	Ordnance Contamination Aerial Site Map
M-5	Plan Administrative, Workshop, and Magazine Areas
M-6	Plan Southern Area
M-7	Administration Area
M-8	Workshop Area
M-9	Demolition Area
M-10	Historical Real Estate Map

AERIAL PHOTO INTERPRETATION

API-1	1948 Photography - Site
API-2	1948 Photography - Administration Area
API-3	1962 Photography - Site
API-4	1962 Photography - Demolition Area
API-5	1973 Photography - Site
API-6	1973 Photography - Demolition Area
API-7	1978 Photography - Site
API-8	1978 Photography - Demolition Area
API-9	1994 Photography - Site
API-10	1994 Photography - Demolition Area
API-11	1978 Photography - Bare Area

ORDNANCE AND EXPLOSIVE WASTE
CHEMICAL WARFARE MATERIALS
ARCHIVES SEARCH REPORT

FORT WINGATE DEPOT ACTIVITY

McKINLEY COUNTY
GALLUP, NEW MEXICO

APPENDICES

ORDNANCE AND EXPLOSIVE WASTE
CHEMICAL WARFARE MATERIALS
ARCHIVES SEARCH REPORT

FORT WINGATE DEPOT ACTIVITY

McKINLEY COUNTY
GALLUP, NEW MEXICO

1.0 INTRODUCTION

1.1 Authority

1.1.1 Environmental Restoration Legislation

In 1980, Congress enacted the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) 42 USC 9601 et seq. Ordnance and Explosive Wastes (OEW) are included in the CERCLA definition of pollutants and contaminants that require a remedial response.

In 1983, the Environmental Restoration Defense Account (ERDA) was established by Public Law 98-212. This Congressionally directed fund was to be used for environmental restoration at Department of Defense (DOD) active installations and formerly used properties. The DOD designated the Army as the sole manager for environmental restoration at closed installations and formerly used properties. The Secretary of the Army assigned this mission to the Corps of Engineers (USACE) in 1984.

The 1986 Superfund Amendments and Reauthorization Act (SARA) amended certain aspects of CERCLA, some of which directly related to OEW contamination. Chapter 160 of the SARA established the Defense Environmental Restoration Program (DERP). One of the goals specified for the DERP is "correction of environmental damage (such as detection and disposal of unexploded ordnance) which creates an imminent and substantial endangerment to the public health or welfare or to the environment."

The DERP requires that a CERCLA response action be undertaken whenever such "imminent and substantial endangerment" is found at:

A. A facility or site that is owned by, leased to, or otherwise possessed by the United States and under the jurisdiction of the Secretary of Defense.

B. A facility or site that was under the jurisdiction of the Secretary of Defense and owned by, leased to, or otherwise possessed by the United States at the time of actions leading to contamination.

C. A vessel owned or operated by the Department of Defense.

The National Contingency Plan (NCP) was established by the Clean Water Act of 1972. The NCP has been revised and broadened several times since then. Its purpose is to provide the organizational structure and procedures for remedial actions to be taken in response to the presence of hazardous substances, pollutants, and contaminants at a site. Section 105 of the 1980 CERCLA states that the NCP shall apply to all response actions taken as a result of CERCLA requirements. 6

The March 1990 National Oil and Hazardous Substances Pollution Contingency Plan given in 40 CFR part 300 is the latest version of the NCP. Paragraph 300.120 states that "DOD will be the removal response authority with respect to incidents involving DOD military weapons and munitions under the jurisdiction, custody, and control of DOD."

1.1.2 Base Realignment and Closure Legislation

Since 1988 Congress has enacted two laws that provide for closure, in part or in whole, of 125 military bases/facilities and the realignment of almost 100 others. The principal mechanism for implementing policy in both statutes has been an independent, bipartisan ad hoc commission. Two of the most pressing issues are first, providing assistance to local communities economically impacted by base closures; and second establishing a cost-effective program of environmental clean-up at bases prior to their disposition.

In October 1988, Congress passed the Defense Authorization Amendments and Base Closure and Realignment Act, Public Law 100-526. This legislation provided the framework for making decisions about military base closures and realignments. The overall objective of this legislation is to close and realign bases in order to maximize savings without impairing the Army's overall military mission. On 28 December 1988, the Defense Secretary's ad hoc Commission on Base Realignment and Closure issued its report with closure and realignment recommendations. Their recommendations provided for closure of 86 installations, partial closure of 5, and the realignment of 54 others. The Secretary of Defense approved the committee's recommendations on 5 January 1989. Among the affected installations is the **Ft. Wingate Depot Activity (FWDA)**, New Mexico, which is targeted for closure and disposal by 1995.

The Defense Base Closure and Realignment Act of 1990 (1990 Base Closure Act), Public Law 101-510 established the process by which DOD installations would be closed and/or realigned. The Defense Legislative directives require that all base closures and realignments be performed in accordance with applicable provisions of the National Environmental Policy Act (NEPA). As a result, NEPA documentation is being prepared for all properties scheduled to be closed or realigned.

1.1.3 OEW Remediation Authority

On 5 April 1990, U.S. Army Engineer Division, Huntsville (USAEDH) was designated as the USACE Mandatory Center of Expertise (MCX) and Design Center for Ordnance and

Explosive Waste (OEW). As the MCX and Design Center for OEW, USAEDH is responsible for the design and successful implementation of all Department of the Army
7 OEW remediations required by CERCLA. USAEDH also designs and implements OEW remediation programs for other branches of the Department of Defense when requested. In cooperation with the Huntsville Division, the U.S. Army Corps of Engineers St. Louis District has been assigned the task of preparing an Archives Search Report (ASR) for **FWDA**, detailing ordnance contamination.

1.2 Subject

The History of **Fort Wingate** dates back to the 1860s. In 1916, the installation was called the **Wingate Ordnance Depot** and became a storage area for explosives. By 1928, the mission changed to include that of packing and shipping explosives. The present **FWDA**, located near Gallup, in McKinley County, New Mexico, was established in 1941 in support of the United States' entry into World War II (WW II). The mission of the installation was to provide services as a supply depot, providing for the receipt, storage, issue, maintenance, and disposal of assigned commodities.

Currently the installation is in caretaker status under the command of the Tooele Army Depot Activity. Facility maintenance is limited and the main duty of personnel assigned is to provide security. Under Base Reorganization and Closure (BRAC), **FWDA** underwent a continuous downsizing of personnel. The active mission of the depot ceased in January 1993 and it remains under the administrative control of the Tooele Army Depot.

FWDA encompasses 34 square miles (22,120 acres) of land in northwestern New Mexico, in McKinley County. The installation is located approximately 8 miles east of the City of Gallup and about 130 miles west of Albuquerque immediately south of Interstate Highway 40 (**Figures 1 & 2**). It is mostly surrounded by undeveloped ranch land used predominately for grazing. The facilities present at **FWDA** include a magazine area containing some 730 earth covered concrete igloos and revetments; numerous buildings used for administration, housing, maintenance and storage; and a workshop area containing several ammunition and maintenance renovation facilities. There is also a demolition and burning and explosive ordnance disposal area. **Maps M-3** and **M-4** present, respectively, the overall installation site plan and recent aerial photo map with areas of concern for ordnance contamination.

Throughout its' history **FWDA** has been an installation involved in the storage, shipping, and demilitarization of ordnance of many and diverse types. OEW has been uncovered in the past and various ongoing environmental actions are directed towards the remediation of the lands in anticipation of eventual closure and excess. The active mission of **FWDA** ceased in January 1993 and the final disposal of the property is scheduled for 1995.

1.3 Purpose

This Archives Search Report compiles information obtained through historical research at various archives and records-holding facilities, interviews with persons associated with the site or its operations, and personal visits to the site. All efforts were directed toward determining the types of munitions or containers, quantities, and known and previously undocumented areas at which disposal operations were probable. The transportation, storage, and potential use or demilitarization and disposal of Chemical Warfare Materials (CWM), along with establishing the chemical agent type, was also given emphasis during the research.

1.4 Scope

The investigation centered on identifying the exact location of potential environmental contamination from the past OEW demilitarization activities occurring on **FWDA**. The depot is known to contain a number of sites on which remediation of unexploded ordnance and/or ordnance residue is required prior to relinquishing ownership under BRAC. In addition to the sites where disposal of conventional munitions of all types occurred, investigations centered on determining if there may have been Chemical Munitions or other CWM demilitarized at the depot. During the archive search period previous environmental reports were collected and reviewed for specific ordnance destruction sites, interviews were conducted with individuals familiar with past depot disposal operations, and old records were gathered and studied to document locations requiring remediation. To a large extent this scope anticipated the compilation of data available from previous completed environmental studies and documents; but with specific attention given to ordnance contamination. The ASR generally eliminates data dealing with other categories of environmental contamination, such as hazardous and toxic wastes (other than OEW), buried tanks, landfill and sewage disposal contamination problems, etc.

The work required falls under the Defense Environmental Restoration Program (DERP). This ASR presents the history of the site, description and characterization of the immediate surrounding area, real estate ownership and description, findings of visual and aerial photo surveys of the various areas of interest, and a detailed OEW and CWM site analysis. Information obtained during this process was used to develop **Conclusions and Recommendations** for further action at the site.

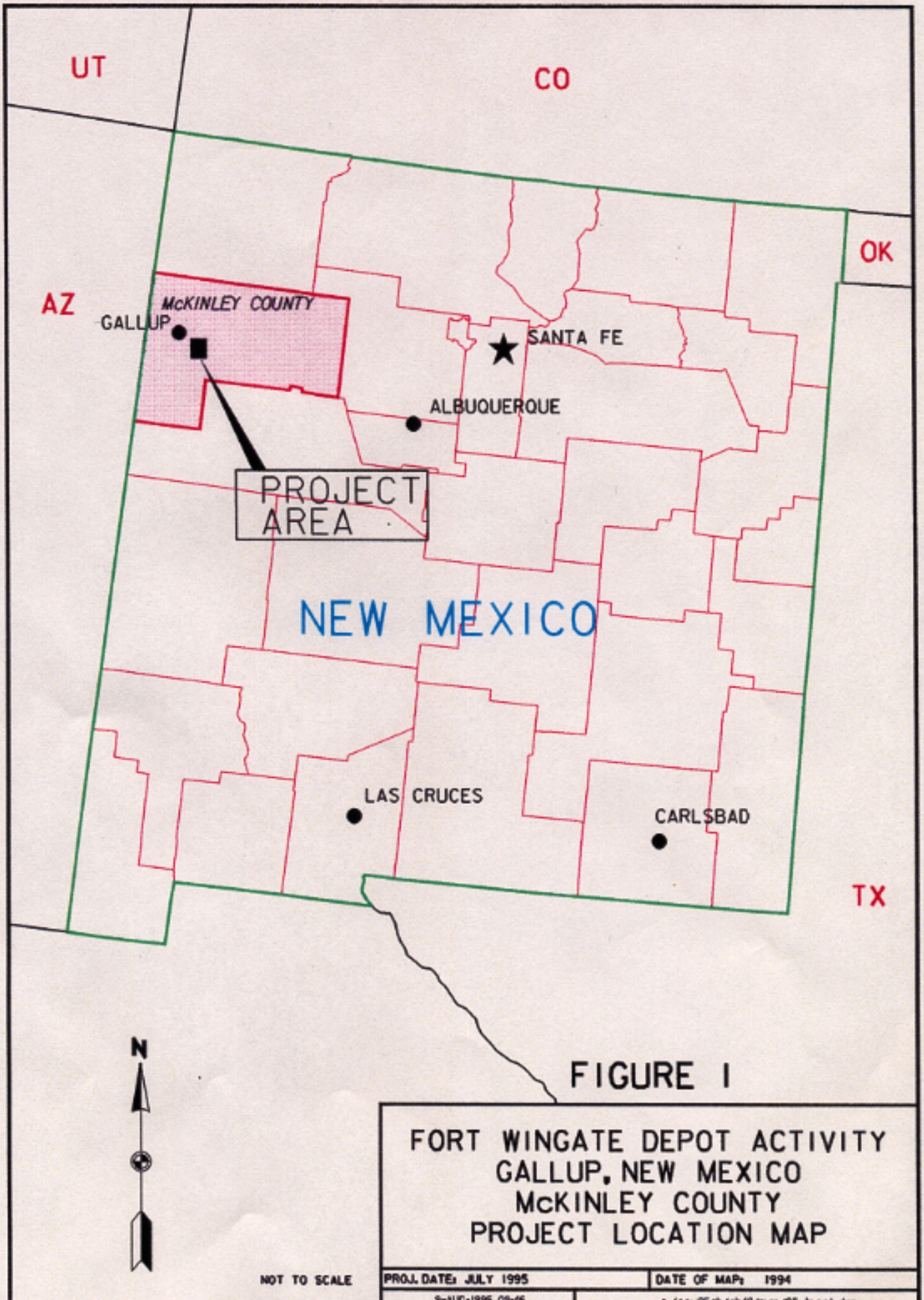

FIGURE 1

FORT WINGATE DEPOT ACTIVITY
GALLUP, NEW MEXICO
McKINLEY COUNTY
PROJECT LOCATION MAP

PROJ. DATE: JULY 1995	DATE OF MAP: 1994
9-AUG-1995 08:46	n:/oew95db/sh48/map/95wingat.dgn

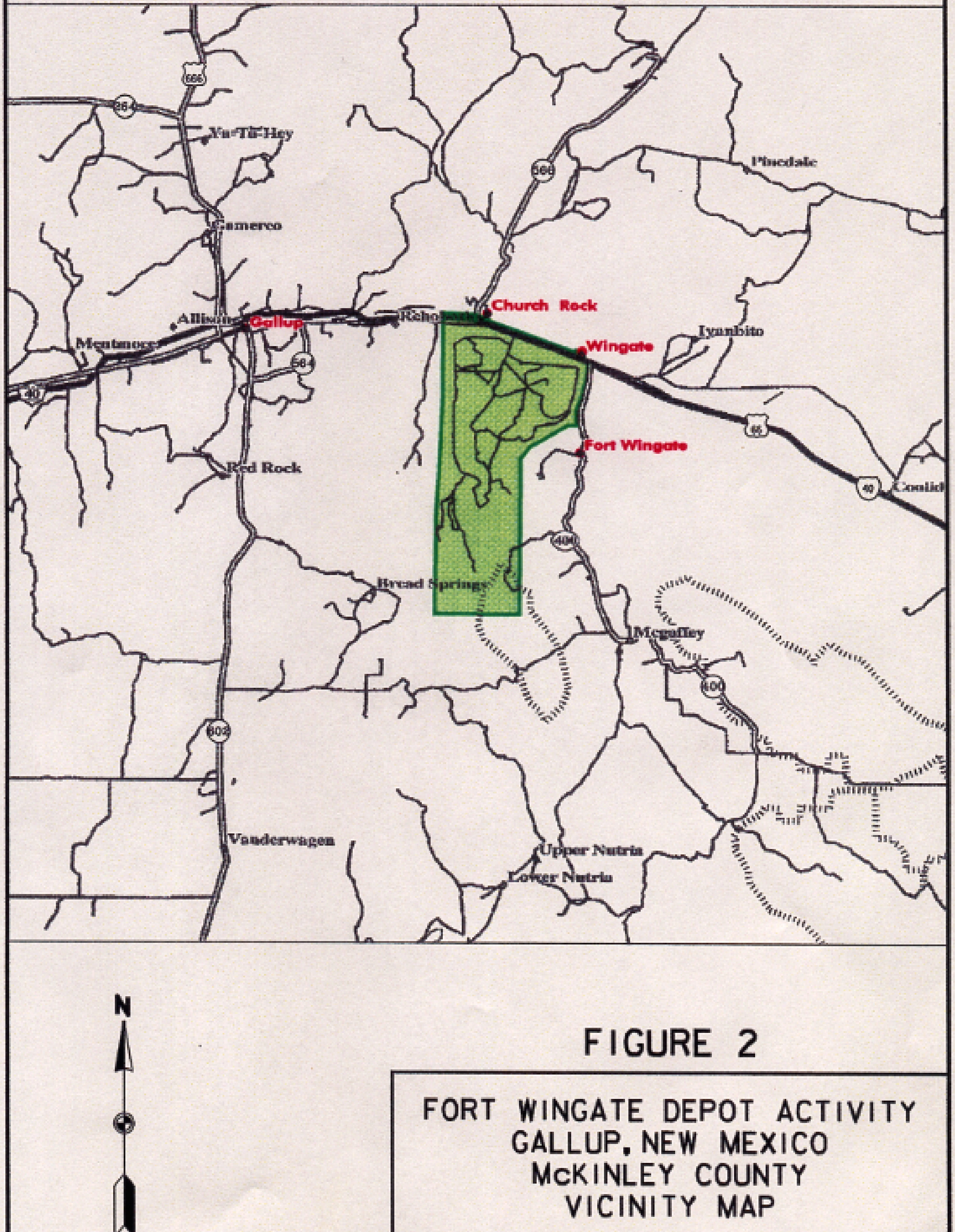

FIGURE 2

FORT WINGATE DEPOT ACTIVITY
GALLUP, NEW MEXICO
McKINLEY COUNTY
VICINITY MAP

NOT TO SCALE

PROJ. DATE: JULY 1995	DATE OF MAP: 1994
9-AUG-1995 08:42	n:\aew95ab\sh48\map\wingtvic.dgn &.alt

2.0 PREVIOUS INVESTIGATIONS

9

2.1 General

FWDA was recommended for closure in December 1988 by the Defense Secretary's Report on Base Realignment and Closure. The U.S. Army Toxic and Hazardous Material Agency (USATHAMA) was assigned the responsibility for centrally managing the Base Realignment and Closure Environmental Restoration Program. In line with this program, USATHAMA has conducted environmental studies to evaluate the installation from the perspective of property transfer and, in general, indicate which areas of the installation may be releasable without any further work.

2.2 *Installation Environmental Assessment (EA) -- Tooele Army Depot, Fort Wingate Depot Activity*

In response to the National Environmental Policy Act (NEPA) of 1969 and Army regulation 200-2 that implemented the NEPA, the EA was prepared for the **FWDA** installation in August 1982. The EA provides a summary of all facets of the **Fort Wingate Depot Activity** which may have environmental significance. It was prepared by the Inland Pacific Engineering Company, Spokane, Washington under direction of the Sacramento U.S. Army Corps of Engineer District. The report was intended to ensure that resources in and around the depot were identified and that potential impacts of these activities on resources both on and off the base were evaluated. Actions to minimize or eliminate adverse impacts insofar as possible were identified so that planning to mitigate could proceed. A copy of the report is maintained on file at the U. S. Army Corps of Engineers, St. Louis District.

2.3 *Final Environmental Impact Statement -- Base Realignment and Closure, August 1991*

The subject *Final Environmental Impact Statement (FEIS)* addresses the realignment or closure of four Army Material Command installations mandated by the Defense Authorizations Amendments and Base Closure and Realignment Act (Public Law 100-256). The actions, alternatives considered, anticipated environmental impacts, the environmental and socioeconomic consequences, unresolved issues, statutes, regulations, and guidelines are addressed for the closure of **Fort Wingate, New Mexico, Depot Activity (FWDA)**, the Navajo Depot Activity in Arizona, the realignment of Umatilla Depot Activity in Oregon, and the Hawthorne Army Ammunition Plant in Nevada.

According to the Executive Summary to the *FEIS*, manpower positions, materials, and supplies (other than strategic stockpile material) from **Fort Wingate**, Navajo, and Umatilla Depot Activities would be eliminated, disposed of through attrition, or transferred to various other U.S Army Material Command facilities. The conventional ammunition missions of the three depot activities are to be moved to Hawthorne Army Ammunition Plant in Hawthorne, Nevada. The plans in 1991 called for the reduction in quantities of ammunition to be moved through current mission shipments, demilitarization, and disposal. No new ammunition

would be shipped to the depots, and ammunition in storage at those sites was to be shipped to the Hawthorne facility or other ammunition facility. Obsolete items were to be demilitarized at the current or a selected demilitarization facility, while items which could not be moved due to safety concerns were to be demilitarized at the current facility. The BRAC Act mandated the closure of **FWDA** by 30 September 1995. 10

Major Conclusions and Findings for **FWDA** outlined in the Executive Summary include the fact that lands at the installation are being considered for return to the public domain via the Bureau of Land Management as a real property disposal action following the Department of Army's proposed closure action. It is noted that the nature and extent of hazardous and toxic contamination at **FWDA** could have a major impact on decisions regarding land reuse. One mission impacting these decisions is the past demilitarization and disposal of obsolete or deteriorated explosives and ammunition that has occurred at **Fort Wingate**. Selected sections of the *FEIS* and the *Record of Decision* are presented in Appendix D-1.

2.4 *Management and Resource Utilization Plan - 3 June 1992*

Prepared for USATHAMA by Metcalf and Eddy, Inc. under a task order to Contract No. DAAA15-90-D-0018, this document developed detailed Work Plans that described how the Environmental Investigation (EI) would be performed at **FWDA**. The full title of the document was *Management and Resource Utilization Plan for Developing Environmental Investigation (EI) Work Plans and Environmental Investigation (EI) Work Plans for Areas Requiring Environmental Evaluation at* ***Fort Wingate Depot Activity (FWDA)***. Elements included within the document were the Technical Plan (Draft), Field Sampling and Analysis Plan, and Health and Safety Plan. The objective of conducting the EI is to determine the nature, extent, and approximate migration routes of contaminant releases to soils, groundwater, sediment and surface water from the Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) identified under the plan. Of special interest in the plan for **FWDA** was the goal of determining by field activities whether or not interim corrective measures or a Feasibility Study was required. This was especially true for those SWMUs or AOCs which had the possibility of unexploded ordnance (UXO). Intrusive methods were not recommended, but rather the areas were to be investigated using UXO contractors and geophysical methods. Soil borings were to be considered at the perimeter of these areas. A copy of the report is maintained on file at the U. S. Army Corps of Engineers, St. Louis District.

2.5 *Final Technical Plan for the Environmental Investigation (EI) at Fort Wingate Depot Activity (FWDA) Gallup, New Mexico*

After a review period the *Final Technical Plan* was forwarded by Metcalf and Eddy, Inc. to USATHAMA on 6 November 1992. The document purpose was to establish procedures and protocol to be followed in conducting an EI at **FWDA**. The *Technical Plan* was organized to describe historical and background information on the depot and its past operations; provide rational for components of the EI program; summarize background site characteristic

data; and describe the scope of EI effort, including site specific investigations. Other features include project management, schedule and reporting requirements (Appendix D-3).

11

2.6 *Base Realignment and Closure (BRAC) Cleanup Plan, Fort Wingate Depot Activity, Gallup, New Mexico -- Version I*

The *Base Realignment and Closure (BRAC) Cleanup Plan*, dated 25 March 1994, was prepared by the Earth Technology Corporation for the U.S. Army Environmental Center, Aberdeen Proving Ground, Maryland. The document contains the status, management and response strategy, and action items related to FWDA's ongoing environmental restoration and associated compliance programs. It is a planning document that, considering the regulatory mechanisms, summarizes the programs necessary to support the full restoration of the installation property as required for property disposal and reuse activities associated with the closure of the installation. Appendix D-4 contains selected information from this Cleanup Plan.

2.7 Interim Status Resource Conservation And Recovery Act (RCRA) Closure

Five environmental restoration sites, in addition to an open burning/open detonation (OB/OD) area, were undergoing remediation under Interim Status RCRA Closure. These sites were identified in a *Draft RI/FS* report prepared in January 1994. See Appendix D-2 for selected excerpts from this report.

According to information in the *Draft Final Interim Status Closure Work Plan - FWDA* , dated November 1994, and prepared by Environmental Resources Management for the U.S. Army Environmental Center, the following Closure Plan Documents had previously been submitted.

- *Draft Interim Status Closure Plan, 6 November 1992*
- *Final Interim Status Closure Plan, 1 March 1993*
- *Final Closure Plan (approved in correspondence by New Mexico Environmental Department), 20 January 1994*
- *Modification to Final Interim Status Closure Plan, 23 May 1994*

2.8 *Master Plan Report - Fort Wingate Depot Activity*

The *Master Plan Report* was prepared for the Sacramento District , U.S. Army Corps of Engineers and the Tooele Army Depot by Higginbotham and Associates, P.C. Completed in March 1987, the report contains evaluations of land use, utilities capabilities, construction, and environmental effects. The purpose of the report was to provide a written record of existing operational and environmental conditions at the installation and the planning rational

used to determine the installation's long-range goals and objectives. Appendix D-5 contains selected information from the Master Plan Report.

12

2.9 Previous Munitions Clearance Surveys, Clearances and Reports

UXB International, Inc. (UXB) has performed UXO services at the subject **Fort Wingate Depot Activity since November 17, 1992.** UXB's most recent service as sub-contractor to Engineering Resource Management, Inc. (ERM), the prime contractor under contract with the U.S. Army Corps of Engineers, Huntsville Division, was to sweep and clear lands outside of the western installation boundary, adjacent to the Open Burn/Open Demolition (OB/OD) sites. The results of these activities over approximately 250 acres are available from the Tooele IRP office, the Huntsville Division Corps of Engineers, and/or ERM (UXB).

A detailed listing of the past UXO and miscellaneous services performed by UXB during the period from 17 November 1992 through 25 August 1993 were furnished by UXB. This is included for reference in Appendix E-3. The following are brief descriptions of the sites investigated during this time frame for Ordnance related contamination:

1. UXO Survey (0"-6") of Functional Test Range 1 (340 Acres) with a total of 124 ordnance items removed.

2. Magnetometer Survey of suspected rocket motor burials at the BMT site.

3. UXO Survey (0"-6") of Functional Test Range 2/3 (555 Acres) with no live ordnance found at the location.

4. UXO Survey and removal at the incinerator near the waste treatment plant (2 Acres) with a total of 7,930 projectiles ranging in size from 20 mm to 40 mm removed from the location.

5. UXO Survey (0"-6") of the then current OB/OD area (653 Acres) with the recovery of 3,639 ordnance items from the area. Of these 515 were deemed to be too sensitive to move and were marked for destruction in place.

6. Visual UXO Survey performed in the portion of the current OB/OD area which is surrounded by permanent fencing (530 Acres) with a total of 6,943 ordnance items removed from within the area. Of these 359 were marked for destruction in place.

7. The Company's miscellaneous services included Preliminary Site Investigations, UXO Safety Escort, Safety Briefings and Site Research Interviews.

ERM prepared a *Briefing on Unexploded Ordnance (UXO) Survey Activities* dated 30 August 1994 for the U.S. Army Environmental Center, Aberdeen Proving Ground, Maryland

(Appendix E-4). The briefing documented the Scope of UXO support activities at **FWDA**; identified areas of potential UXO concern and areas proposed for remediation; summarized past UXO survey activities; provided information and data on ordnance items identified, marked, and stockpiled; and provided drawings for future use in remediation of UXO areas.

In December 1995. ERM prepared the ***Fort Wingate Depot Activity, Gallup, NM, Unexploded Ordnance (UXO) Survey Report*** for the U.S. Army Environmental Center to summarize the site activities related to UXO performed in support of the Environmental Investigation at **FWDA**. This report discussed the scope of survey efforts performed by ERM and their subcontractor UXB, summarized the areas surveyed by their companies, and presents their findings. The main body of this report is furnished as Appendix D-6.

3.0 SITE DESCRIPTION

3.1 Location

FWDA encompasses 34 square miles (approximately 22,120 acres) of land in northwestern New Mexico, in McKinley County. The installation is located approximately 8 miles east of the City of Gallup and about 130 miles west of Albuquerque immediately south of Interstate Highway 40. It is bordered on the west by the Zuni Indian Reservation, on the south and east by the Cibola National Forrest, and on the north by the Red Rock State Park. The Navajo Indian Reservation also spreads out to the north of **Fort Wingate**. The installation can be accessed by car from old U.S. Highway 66, which serves as the outer road for Interstate 40, and is served by the Santa Fe Railroad (**Figures 1 & 2**).

3.2 Existing Land Usage

The **FWDA** is a military reservation presently under control of the U.S. Army. The depot was recommended for closure in accordance with the 29 December 1988 Secretary of Defense's Commission on Base Realignment and Closure. In accordance with the Defense Authorizations Amendments and Base Closure And Realignment Act (Public Law 100-526) **FWDA** is targeted for disposal in September 1995.

The facility is currently under caretaker status pending resolution of land disposal actions. A number of existing buildings are being used by non-DOD groups. In a U. S. Department of Agricultural program, local Native Americans use two of the existing warehouse buildings (Bldgs. 12 & 13) for food distribution. A private company, TPL Inc., has entered into an agreement with the Army for demilitarization of Energetic Materials. The contract includes their use of certain buildings and facilities at **FWDA**. Ongoing environmental remediation contractors also maintain site offices in the administration area. Some property is used for grazing livestock.

3.3 Demographics of the Area

3.3.1 Center of Activity: The **FWDA** site is located near the City of Gallup, McKinley County, New Mexico.

3.3.2 Population Density:

City: Gallup	County: McKinley
Area: 12.5 sq. mi.	Area : 5,442 sq. mi.
Pop.: 19,154	Pop. : 60,686
PD : 1,532 persons per sq. mi.	PD : 11 persons per sq. mi.

3.3.3 Types of Businesses: A major industry in the Gallup area is manufacture of Indian jewelry. Ranching and coal mining are also significant industries in McKinley County. Of the people in McKinley County employed by businesses, about 40 percent are employed in

the retail trade businesses. Also prominent are services businesses at about 30 percent, as well as, manufacturing businesses at about 8 percent, and wholesale trade businesses at about 7 percent. Foregoing percentages are at mid March 1991.

3.3.4 Types of Housing: Housing in Gallup is composed of both single family and multi-family dwellings.

3.3.5 New Development in the Area: Retail business, mainly groceries and restaurants, are the only significant new developments in the Gallup area.

3.3.6 Typical Cross Sections of the Population: Approximately 49.8 % of the population of Gallup is white, 1.2% black, 33.2% American Indian, Eskimo or Aleut, 1.1% Asian or Pacific Islander, and 14.7% other races. The percent of the total population (of any race) that is of Hispanic origin is 34.7%. The part of the population under the age of 18 is 34.5%, and the part over the age of 65 is 7.7%. The median age is 28.9 years. The median value of 2,641 specified owner-occupied housing units in Gallup is $68,200. The number of business establishments in McKinley County can be broken down by type as follows: manufacturing 3.7%; agriculture 0.1%; services 31.0%; trade and financial 51.3%; and other 13.9%.

3.4 Climatic Data

The climate of the area is generally very dry and relatively mild throughout the year, due primarily to the high elevation and northern mountains which usually shield the area from extreme cold. Abundant sunshine is the norm, with more than 270 days/year being clear or only partly cloudy. Precipitation is extremely variable, with the bulk of the precipitation occurring during the summer months from thunderstorms. Snowfall at the site averages 17.5 inches per year, with the heaviest snowfall in December and January. Any snow typically melts quickly due to the warm daytime temperatures. The high elevation and generally clear days give rise to large diurnal temperature fluctuations. Changes of 40 degrees or more from daytime highs to night time lows are typical during the summer.

Summer temperatures are quite warm, with 90°F or higher occurring from May through September. Temperatures exceed 100°F regularly during the summer, with a record high of 109°F occurring in July 1971. These high temperatures are moderated by very low relative humidities. Winter temperatures are mild, with temperatures often exceeding 70°F. The record low temperature is -18°F occurring in January 1937. However, the nearest source of long term climatologic data is at Winslow, Arizona, located about 120 miles west-northwest of **FWDA** and at an elevation about 2000 feet lower. Temperatures are usually more extreme as elevations increase; therefore temperatures at the site may be expected to be somewhat warmer in summer and cooler in winter than the **TABLE 3-1** values.

Winds vary from about 7-11 miles per hour from the southeast through the year. Wind speeds up to 63 miles per hour have been recorded at Winslow. Winds during the spring months cause much blowing dust, the least attractive feature of the local climate. Destructive winds, such as tornadoes, are rare. Climatological data for the area are summarized in **TABLE 3-1**.

1/

TABLE 3-1
CLIMATOLOGICAL DATA FOR FORT WINGATE
GALLUP, NEW MEXICO

Month	Temperature (F)			Precipitation	Wind Velocity	Wind Direction
	Average Daily		Average Monthly			
	Min	Max	Mean	Average (Inches)	(mph)	
January	19.0	45.0	32.0	0.53	7.1	SE
February	23.6	53.2	38.4	0.41	8.5	SE
March	29.1	60.7	44.9	0.51	10.6	WSW
April	36.0	70.0	53.0	0.32	11.3	SW
May	44.4	79.9	62.2	0.43	10.9	SW
June	53.6	91.0	72.3	0.44	10.6	SW
July	63.0	94.5	78.8	1.65	9.1	WSW
August	61.1	91.1	76.1	1.50	8.4	SW
September	52.7	85.2	69.0	0.94	8.2	SW
October	40.1	73.1	56.6	1.32	7.7	SE
November	27.8	57.9	42.9	0.63	7.3	SE
December	19.3	46.0	32.7	0.61	6.7	SE
Annual	39.1	70.6	54.9	9.40	8.9	SE

Source: NOAA 1991. Local Climatological Data (temperature/wind) of Winslow, Arizona. NCDC, 1948-79, Precipitation Data for Gallup 5 E, New Mexico.

3.5 Geology/Physiography and Soils

3.5.1 Geology/Physiography

The **FWDA** site is located in the Datil section of the Colorado Plateaus physiographic province. The site is situated within the valley of the Puerco River which cuts through natural boundaries on three sides. On the north, the boundary is the Wingate cliffs, on the west is the steeply dipping, sedimentary Hogback, and along the southern boundary are the

Zuni Mountains. Elevations within the site range from 8,248 feet near the southern site boundary to 6,640 feet in the northwestern corner of the site. Steep to abrupt slopes in the mountains dominate the southern portion of the installation, moderate slopes in the foothills lie between mountains and valleys, and gentle to undulating slopes occur in the valley in the northern portion of the site. 18

The rocks of the site and the surrounding area are of Permian, Triassic, Jurassic, Cretaceous, and Quaternary ages. The outcropping geologic formations consists of large areas of alluvial sand and gravel, and the Chinle Formation. There exist smaller outcrop areas of the Glorieta sandstone, the Cravasse Canyon Formation, and several other small sandstone and shale outcrops in the southern edges of the site. These smaller outcrop areas in the southeastern section of the **Fort Wingate** site are part of the Zuni Mountains and dip steeply to the west and north under the site. Minerals that have been mined from the surrounding area are coal, uranium, clay, sandstone, salt, asphaltic sandstone, basalt, sand, and gravel.

3.5.2 Soils

The soils of **FWDA** can be divided into two types. In the northern section of the site, the soils are underdeveloped, caused by the classic dry and arid climatic conditions of the area. In the more rugged southern area, the soils are more developed and deeper. Rock outcrops are at or near the surface in 25% of the site. Slopes range from 1% to 70%.
The composition of the site soils is generally sandy silty clay, or a clayier material with varying proportions of silt, sand, gravel, stones, or rock fragments. The average soil depth is 12 inches, but the soils can be as great as 40 inches deep. Shale or sandstone are the predominant underliers of the soils. There are wind and water erosion hazards associated with the soils, an example of which is the need to replace soils that were washed off the igloo type ammunition storage facilities within the site boundaries.

3.6 Hydrology

3.6.1 Surface Water

Fort Wingate is about 8 miles east of Gallup, New Mexico, which is near the New Mexico-Arizona border. The site is located in the South Fork Puerco River Valley. The river flows west, with tributaries entering from the north and south. The South Fork enters the Puerco at Gallup. The Puerco is a tributary of the Little Colorado River, which in turn, flows to the Colorado River, entering between Glen Canyon and Boulder Dams on the Colorado. **Fort Wingate** site topography shows elevations generally from 6650-6700 feet NGVD (Net Geodetic Vertical Datum) at the South Fork Puerco River to about 7100 feet NGVD. Nearby mountain peaks rise to nearly 8000 feet NGVD. Site runoff flows in a northerly direction, by numerous unnamed dry washes, to the South Fork Puerco River.

Flooding of the site by the South Fork Puerco River appears unlikely. Essentially all of the area under investigation is from 25-500 feet above the bankline of the river. Flooding is very infrequent and of shallow depth and short duration. No gage data exist for the South Fork Puerco River; however, two U.S. Geological Survey streamgage stations are located in

the general area. The USGS gage site Milk Farm Canyon near **Fort Wingate** has continuous data from 1949-1991 for an unnamed 14 square mile tributary of the South Fork. This stream is generally dry and is located within the **Fort Wingate** boundaries, but outside the site boundaries, except near its mouth. The greatest peak discharge recorded in nearly 40 years of data was 1360 cubic feet per second (cfs) in 1949. Most years show peak discharges less than 200 cfs. The USGS gage site Puerco River at Gallup, New Mexico has data since 1940 for the 558 square mile upstream drainage area, which contains all of the South Fork. The maximum discharge recorded in more than 50 years of data was 12,000 cfs in July 1972.

Significant flow occurs only after thunderstorm periods, generally during the mid to late summer months. Streams in the area are dry much of the year.

3.6.2 Ground Water

FWDA is underlain by the San Andres-Glorieta aquifer. This aquifer is composed of the San Andres Limestone and the Glorieta Sandstone which crops out near the southern boundary of the site. Generally, the water quality from the aquifer is good, but often high in iron, sulfate, and total dissolved solids. The top of the aquifer is located about 1,100 feet below the land surface near the former Depot Headquarters in the north-central part of the site. The aquifer is about 200 feet thick and under artesian pressure.

There are other potential water supplies in the site and the surrounding area. The alluvial basin in the northern portion of the site and beyond is composed of Quaternary system alluvium. The saturated thickness of the water bearing areas of the alluvium varies greatly with location. There is an example of one well to the north of the site, which tops the alluvium at 50 feet below land surface, producing up to 100 gallons/minute. The saturated thickness is 165 feet. Recharge of the aquifers comes from rain and snow melt from the surrounding mountains.

3.7 Ecology

The information provided for these sites has been compiled from information provided by the U.S. Fish and Wildlife Service and the State of New Mexico Department of Game and Fish.

The U.S. Fish and Wildlife Service has indicated that the following Federally protected species may be found in the vicinity of **Fort Wingate**, New Mexico: southwestern willow flycatcher (Empidonax traillii extimus), endangered; peregrine falcon (Falco peregrinus), endangered; bald eagle (Haliaeetus leucocephalus), endangered; Mexican spotted owl (Strix occidentalis lucida), threatened; northern goshawk (Accipiter gentilis), candidate; western burrowing owl (Athene cunicularia hypugea), candidate; Ferruginous hawk (Buteo regalis), candidate; mountain plover (Charadrius montanus), candidate; spotted bat (Euderma maculatum), candidate; black-footed ferret (Mustela nigripes), endangered; small-footed myotis (Myotis ciliolabrum), candidate; long-eared myotis (Myotis evotis), candidate; occult little brown bat (Myotis lucifugus occultus), candidate; fringed myotis (Myotis thysanodes), candidate; long-legged myotis (Myotis volans), candidate; Arizona leatherflower (Clematis

hirsutissima var. arizonica), candidate; Zuni (rhizome) fleabane (Erigeron rhizomatus), candidate; and Sivinski's fleabane (Erigeron sivinskii), candidate. The U.S. Fish and Wildlife Service also indicated that proposed critical habitat for the southwestern willow flycatcher and the Mexican spotted owl is present on **Fort Wingate.** 20

The following State threatened and endangered species are known or likely to occur in McKinley County: Zuni bluehead sucker (Catostomus discoholus jarrovi), endangered; bald eagle, threatened; American peregrine falcon (Falco peregrinus anatum), endangered; Arctic peregrine falcon (Falco peregrinus tundrius), endangered; southwestern willow flycatcher, threatened; and gray vireo (Vireo vicinior), threatened.

No additional information on the occurrence of rare or endangered species or natural communities is known at this time. This does not mean that other state or federally-listed species may not be present within the areas of interest. An on site inspection by appropriate state and federal personnel may be necessary to verify the presence, absence or location of listed species, or natural communities if remedial action is recommended as part of the final ASR.

4.0 HISTORIC ORDNANCE USAGE

21

4.1 General Historical Overview and Past Use

4.1.1 Past Use

The property known as the **Fort Wingate Depot Activity (FWDA)**, as either a post, fort, or some form of military installation, has been nearly under the continuous control of the U.S. Government since the 1850s. Immediately prior to BRAC, the installation was an active army depot activity under the Tooele Army Depot. The former mission was to store, supply, and receive material; and to dispose of obsolete or deteriorated explosives and ammunition.

The previous owners were Native-Americans who were involved in agricultural activities and grazing. Over the years **FWDA** land has been reduced with some properties going to the National Forest Service, Department of Interior, and the Bureau of Indian Affairs for reservation use (Cantner 1979). The Department of Agriculture also conducted a sheep ranching operation in the area.

4.1.2 General Historical Overview

The **Fort Wingate** area is rich in culture and history. Aside from the present Navajo and Zuni culture, evidence of many ancient Indian civilizations are prevalent throughout the vicinity. The most notable of these cultures were the Pueblo and the Anasazi. Because of its abundant water and game, the Wingate Valley was a favorite meeting place for trade of all kinds. It was also a natural passage through the mesas and plateaus of New Mexico and thus linked trade routes from the Rio Grande to California (Department of the Army 1994).

Fort Wingate Ordnance Depot traces its history back through three locations. An Army post was originally established in 1850 near Seboyeta. In 1862 it was moved to the present site of San Rafael, near Grants, New Mexico. This was the "Old" **Fort Wingate**, named for Captain Benjamin Wingate and established by General James Carleton. In the meantime, Fort Fauntleroy (later to become **Fort Wingate**) was established as a temporary post in 1860. Located at Bear Springs, this fort was east of the present **FWDA**. Later this installation was renamed Fort Lyon, which was abandoned in 1862 and the personnel assigned to the "Old" **Fort Wingate**. Later Fort Lyon was to become known as **Fort Wingate**, and the post was moved back to Bear Springs in 1868 to supervise the Navajos. A permanent post was established in 1870 and this became the **Fort Wingate Military Reservation**. Strife among Indians, Mexicans, and the United States was controlled to some degree by the cavalry stationed at the military reservation between 1868 and 1911. The last armed expedition by the United States occurred in 1907 from **Fort Wingate**, and the fort was abandoned again in 1911. The fort was ceded to the United States by New Mexico legislature in 1912. Portions of the site became what is now Cibola National Forest (Department of the Army 1982).

Reactivated again in 1914, the installation served as an internment camp for Mexican Civil War refugees. In 1916, **Fort Wingate** was renamed the **Wingate Ordnance Depot** and became a storage area for high explosives, primarily TNT. In 1919, a magazine area was established and construction commenced on storage buildings and magazines. The mission of **Fort Wingate** changed from inactive storage to that of repacking and shipping explosives in 1928. Early in 1941, with the advent of WW II, an extensive building and reconstruction program was completed to meet the needs of shipping foreign aid and supplying armies overseas. By 1942 the facility employed about 1,000 people and had begun the storing and shipping of explosives other than TNT in support of the WW II effort. During 1950, the depot handled ammunition for the Korean War. It was also at this time that certain land tracts were deeded to the Department of Interior, and some land was used as right-of-way for Highway 66 (Department of the Army 1982). 22

The **Wingate Ordnance Depot** was redesignated the **Fort Wingate Army Depot** under the U. S. Army Supply And Maintenance Command in 1960. At this time, over 30,000 acres of depot land were transferred to the U. S. Forrest Service. During the period from 1963 to 1967, depot land was used by the White Sands Missile Range to test the accuracy and mobility of the Pershing Missile System. Several missiles were launched from the southeast corner of the site and impacted at White Sands. In 1966, **Fort Wingate Army Depot** increased its activities by shipping munitions for the Vietnam War (Metcalf & Eddy 1992).

Placed in reserve status in 1971, the facility was downgraded to a depot activity under the command of the Pueblo Army Depot. In 1975, **FWDA** was transferred to the control of the Tooele Army Depot, under which command it remains (Department of the Army 1982).

4.2 Historical Summary of OEW/CWM Activities

4.2.1 Overview

In existence since 1860, **Fort Wingate** is a government owned and operated facility under the command of the U.S. Army. The installation generally consists of an administration area, workshops, munitions storage areas (igloos) (**Map M-5**) and the southern property (**Map M-6**). Large areas within the **FWDA** are undisturbed by military activities, including the southern part of the installation (Earth Technology Corporation 1994). The mission of **FWDA** was the storing, care, preservation, shipping, and demilitarization of conventional munitions. After World War I (WW I), the War Department made **Fort Wingate** the largest high-explosives munitions storage installation in the world. Large quantities of munitions have been stored and destroyed at **FWDA**. Disposal was by both burning and detonation. There were also numerous demilitarization facilities. During the 1960s, Pershing Missiles were fired from **FWDA** to an impact area at White Sands, New Mexico. Active in WW II, Korea, and Vietnam, activities at **FWDA** have been reduced over the last 20 years. Scheduled to close in 1995, **FWDA** is currently inactivated and in a caretaker status. All munitions have been removed and shipped to the Tooele Army Depot in Utah (Metcalf & Eddy 1992).

4.2.2 Historical CWM Activities

23 There is no indication that chemical warfare weapons were ever destroyed or demilitarized at **FWDA**; but 155mm Artillery Shells loaded with Chemical Warfare Agent were reported to have been stored at and shipped through the depot to other installations. This is supported by the archival research that reveals that poison gas was handled during WW II (Appendix E-5). An article written in 1946 for the *Gallup Independent*, states that the railroads at the depot shipped "great quantities of poison gas during the war without a person being killed" (*Gallup Independent* 1946). Anecdotal evidence also indicates that mustard gas (155 mm) was temporarily stored at **FWDA** at one time, but these munitions were later shipped to Pueblo Army Depot. As a general rule, however, **Fort Wingate** did not store chemical munitions other than white phosphorus, smoke rounds, and riot control agents (Talamante 1991).

4.2.3 Historical OEW Activities

Beginning in 1916, high explosives were stored at **Fort Wingate**. Temporary storage areas and magazines were built in 1919 and in the 1940s permanent igloos, magazines, and administrative buildings were constructed. Most of the central portion of the property (about 7,400 acres) is occupied by magazines for ammunition storage (**Maps M-3**, **M-4**, and **M-5**). This area contains 760 concrete and earth covered igloos as well as revetments and related storage facilities (Metcalf & Eddy 1992).

Throughout WW II the activities on **FWDA** escalated in importance; and at the end of the war munitions returning from overseas were being stored on the depot. The actual renovation and demilitarization of ammunition began in the 1940s when ammunition workshop buildings were erected for those specific purposes (**Map M-8**). Demilitarization of explosive ordnance of many types continued until around 1967 when operations ceased.

The majority of these activities were conducted in the workshop or restricted area. This area (500 series buildings) contained ordnance processing shops and washout facilities as well as extensive storage magazines.

At the time of its deactivation, there were three Functional Test Ranges (FTR) at **FWDA**. FTR No. 1 is located in the east central part of the fort and was used for powder burning in the 1940s and for testing flares and grenades in the 1950s. FTR No. 2 was used in the 1960s to test a variety of munitions, rockets, and mortars. FTR No. 3 was used in the same period to test high explosives. These latter two ranges are located in the northeastern part of the **FWDA** (**Map M-5**). As with most military installations, **FWDA** also had a firing range. Occupying part of the eastern portion of the depot, this firing/pistol range was located about 2.5 miles from the administration area, and was approximately 70 by 200 feet in size. It is separated from the surrounding areas by a road, buffer zone, and a boundary fence. Firing was directed toward a high dirt embankment. Although there are no maneuver areas at **Fort Wingate**, there are several small training areas (see **Maps M-3** and **M-4**). Off and on over the years the New Mexico National Guard used parts of **Fort Wingate**, especially the firing

range, for training purposes. The area used by the New Mexico National Guard was approximately 600 acres in size (Metcalf & Eddy 1992).

24

The munitions burning and demolition areas at **Fort Wingate** were located in an area known as Horse Valley. The fenced-up Horse Valley (an Arroyo) is near the west central part of the installation and consists of several open burning grounds and demolition areas (**Maps M-3**, **M-4**, and **M-9**). In the mid-1950s the Army permitted up to 30,000 pounds of explosives to be burned there at one time (Environmental Resources Management, Inc 1994).

There are also missile launching sites at **FWDA**. Ballistic missiles were fired and tested at various times from 1963 until 1967. This area is in the southeastern corner of the depot property. During the same time frame, a Pershing Missile test site was located in the same area near Lake McFerren.

The active mission of **FWDA** ceased in 1993. Under the auspices of the Defense Authorization and Base Closure Act of 1988, the **FWDA** has been targeted for closure and disposal in 1995 (Department of the Army 1991).

4.3 Records Review

National Archives-Rocky Mountain Region
Building 48, Denver Federal Center
Denver, CO 80225

Record Groups (RG) 49, Bureau of Land Management, RG 75, Bureau of Indian Affairs, RG 77 Records of the Corps of Engineers, RG 92 Records of the Quartermaster General, RG 156, Records of the Chief of Ordnance, and RG 121, Records of the Public Buildings Service were reviewed at the Denver Archives. Archivists found maps, copies of histories, ammunition records, documents of land transfers, and minutes of meetings.

RG 156 Records of the Chief of Ordnance
Accession 8NS-156-93-206, Boxes 1-4

RG 121 Records of the Public Buildings Service
Accession 8NS 121-93-193
Real Property Case Files 1946-72 Boxes 30, 33, 63. 70, 119

Tooele Army Depot
Tooele, Utah 84074
Denver, CO 80225

Historical, newspaper, and real estate information was obtained from boxes of records at the Forms and Publications Branch at the Tooele Depot. There were no record group numbers assigned. Also obtained were bound copies of previous environmental and ordnance studies from the Engineering/Environmental and Base Closure Offices.

Early History
Box A-5, 1 of 2, 1921-1935

25

Early History
Box A-6, 2 of 2, File 314.7

Federal Records Center - Denver
Building 48, Denver Federal Center
Denver, CO

Record Groups 291 and associated **Fort Wingate** GSA records were reviewed, but no information was located on the **Fort Wingate** site.

Chemical and Biological Defense Agency Historical Office
CBDA/HO
Aberdeen Proving Ground
Edgewood, MD 21010

There were no records found at Edgewood for **Ft. Wingate Ordnance Depot.**

National Archives and Records Administration
Southwest Region
501 West Felix St.
Ft. Worth, TX 76115

On the records center side, GSA Records concerning disposal of the Ft. Wingate Trading Post were reviewed. There was no information on **Fort Wingate** proper.

RG 291 Records of the General Services Administration
Property Disposal Records, **Fort Wingate** (Trading Post)

National Archives-Suitland Branch
4205 Suitland Road
Suitland, MD

The following record groups were reviewed. Information found included photographs, maps, historical information, and real estate records.

RG 77 Records of the Chief of Engineers
Entry 393 - Historical Record of Buildings
Box 286, **Wingate Ordnance Depot** Folders, 1-4

RG 92 Records of the U.S. Army Quartermaster General
Construction Files, Pre-1942

RG 156 Records of the Chief of Ordnance
Box A430, History of Ordnance Installations, 1940-1945

RG 159 Records of the Office of the Inspector General
Inspection Reports, 1912-1939, Box 78

RG 175 Records of the Chemical Warfare Service
Index Briefs, 1918-1942, Box 525

RG 291 Records of the General Services Administration
Property Disposal Records, Accession No. 291-82-0002
Box 7 of 10, **Fort Wingate**

RG 338 U.S. Army Continental Commands
No information found.

National Archives
8th and Pennsylvania
Washington, D.C. 20408

Under RG 407, the archival team found information on the clearing of explosives from **Ft. Wingate** in the 1940s.

RG 407 Records of the Army Advocate General
Project decimal Files 1940-1945
Box 4487, Folder 013.26 to 344

National Personnel Records Center
Military Records
9700 Page Avenue
St. Louis, MO 63132

Records were reviewed at this location, but no information was found on **Ft. Wingate**.

U. S. Air Force Historical Center
Bldg. 1405, Chennault Circle
Maxwell AFB, AL. 36112

Records were reviewed at this location but no information was found on **Ft. Wingate**.

National Archives And Records Administration.
College Park Branch
8601 Adelphi Road
College Park, MD 20740

This facility was still in the process of transferring records and we looked at several boxes of material. There were no records found for **Ft. Wingate**.

4.4 Summary of Interviews

2/

At Gallup, NM, interviews were conducted to obtain background and first hand knowledge of **Fort Wingate**. Local individuals, historians, and military veterans were contacted during a local source research trip. Names, addresses, and a synopsis of the interviews are presented below:

Mr. A. M. Kilpatrick
1206 East Aztec
Gallup, NM
Telephone: (505) 863-6966

Mr. A.M. "Buster" Kilpatrick, was Chief, Ammunition Operations Division, **Ft. Wingate**, for many years. His tenure of federal service was from 1942-1972. He recalled initial demil operations commencing in 1943 and full-scale operations in 1946. He did not recall any ordnance being found near the Ft. Wingate School; but he mentioned problems with the demil (short for demilitarization - the removal of powder, etc., from munitions) operation of WW II-era Butterfly bomb munitions. Apparently, according to Mr. Kilpatrick, some of these munitions were scattered above-ground during demil operations. Mr. Kilpatrick mentioned that Mr. "Ike" Lewis, who lives in Ramah, NM, is very knowledgeable about the ammunition storage area.

Mr. Rudolpho Ortize
Gallop, NM

Mr. Rudolpho Ortize, a former leader for demil operations was able to describe various aspects of **FWDA** demil operations. Eight "pits" were utilized for demil operations, according to Mr. Ortize. He did not recall any problems with "kick-out" other than some problems with the demil WW II-era Butterfly bombs.

Mr. Eloy Salas
Gallop, NM

On 19 January 1995 Mr. Eloy Salas, former employee who was familiar with the demil operations at **Ft. Wingate** was interviewed. He indicated that various white phosphorous (WP) rounds were demiled near the demil range control tower. Mr. Salas confirmed the "kick-out" problem with demolition of the WW II-era Butterfly bombs. He mentioned the TNT washout facility (Bldg 522) and the accompanying leach-out contamination; and stated that 155mm mustard rounds were stored in Area H. All types of conventional munitions were stored at **Ft. Wingate** up to 10,000 lb bombs, according to Mr. Salas. It was his knowledge that prior to WW II, bulk TNT was stored at **Wingate Ordnance Depot** and later shipped to England under the Lend-Lease Program.

Mr. Ike Lewis
Ramah, NM

28

On 19 Jan 95, Mr. Lewis was contacted at his residence in Ramah, NM. He recalled the temporary storage of 155 mm Mustard rounds at **Ft. Wingate.** He did not recall any demil of chemical munitions at **Ft. Wingate.** Mr. Lewis, likewise, recalled the above-ground problem associated with the demil of WWII-era Butterfly bombs.

4.5 Interpretation of Aerial Photography and Map Analysis

4.5.1 Interpretation of Aerial Photography

a. Photoanalysis and land use interpretation were done using the following listed photography:

Photography Date	Scale	Source	Identifier(s) Frame(s)
21 Dec 1948	1" = 4000'	National Archives	17 and 18
6 Apr 1949	Oblique	National Archives	54 and 55
27 Nov 1962	1" = 2500'	EROS	1-75 thru 78, 1-87 thru 90, 1-118 thru 121, 1-139 thru 142
30 Sep 1973 thru 23 Nov 1973	1" = 2583'	BLM	1-34-32 thru 36, 1-35-32 thru 35, 2-33-30 thru 34, 11-36-35 thru 37
30 May 1978 and 31 May 1978	1" = 3333'	ASCS	178-173 thru 178, 278-19 thru 24, 278-117 thru 122
5 Jul 1994	1"=2000'	T.R. Mann Assoc.	1-001 thru 008, 2-001 thru 008, 3-001 thru 003

b. The maps cited at paragraph 4.5.2a below were used as references for the photography.

c. Photography listed above covering the **Fort Wingate** site was examined. Features seen on the photography and considered to be significant are shown and described at **Maps API-1** through **API-11**. A listing of these maps indicating the part of the site covered and year of photography analyzed and used as a map base is given below.

Map No.	Part of site	Year of Photo
API-1	Northern two-thirds.	1948
API-2	Administrative area.	1948
API-3	All.	1962
API-4	Demolition area.	1962
API-5	All.	1973
API-6	Demolition area.	1973
API-7	All.	1978
API-8	Demolition area.	1978
API-9	All.	1994
API-10	Demolition area.	1994
API-11	Bare area.	1994

d. Terrain at the site is hilly with local relief commonly one hundred feet and more. Steep hogbacks are seen along the west side of the site. Surface drainage pattern is well developed and drainage is generally south to north across the site. Most channels appear to be dry. Small dams forming ponds are seen along the channels. One large lake (about 1000 feet diameter) formed by dams is seen near the administrative area at the north end of the site. Main land use in the area appears to be agriculture, grassland with sparse to moderate growth of trees. Interstate Highway 40 and a railroad run east-west just north of the site. Paved roads run north-south both east and west of the site. Most other roads in the vicinity are unpaved. Gallup, New Mexico, a town of about 19,000 people is located about six miles west of the site. Scattered rural development is seen north and west of the site. Several mines are shown north of Gallup on the USGS map sheet.

4.5.2 Map Analysis

a. The site was analyzed using the following maps: 30

(1) USGS 7.5 minute quadrangle map sheets: GALLUP EAST, N. MEX., 1963, photorevised 1979; CHURCH ROCK, N. MEX., 1963, photorevised 1979; PINEDALE N. MEX., 1963; CINIZA, N. MEX., 1962, photorevised 1980; FORT WINGATE, N. MEX., 1963, photorevised 1979; BREAD SPRINGS, N. MEX., 1963, photorevised 1979.

(2) Drawing, Real Estate, **Wingate Ordnance Depot**, War Department, OCE, Construction Division, 28 June 1944.

(3) **Fort Wingate Depot Activity**, Drainage Site Map, Metcalf and Eddy, Figure 4.5, undated.

b. Review of the above cited map sheets confirms general description of terrain and land use at paragraph 4.5.1.d above. Also, the maps were useful in locating boundaries and identifying features on the photography.

5.0 REAL ESTATE

31

5.1 DOD Ownership

With reference to **Map M-10**, Historic Real Estate, and to the 7 July 1937 metes and bound description furnished as Appendix F-1, it is evident the **Fort Wingate Military Reservation** once comprised 64,076.56 acres, more or less. This 10-square mile tract was set aside by Executive Order on 18 February 1870 for military use. Later by Executive Order dated 26 March 1881, the reservation was extended on the south by a tract of land 3 miles wide by 10 miles long for the purpose of supplying the **Fort Wingate** with lumber. Odd numbered sections were included in a grant to A & P Railroad by an Act of 22 July 1866. This added 9,586.56 acres to the boundary. Certain documents refer to the total area as approximately 83,188.97 acres, suggesting that the alternate tracts reserved to the railroad, eventually, legally were once part of the **Fort Wingate Army Reservation.**

Other transactions have occurred and these are outlined on the briefing sheet inclosed with this ASR as Appendix F-2. The actual legal history or property acquisitions and transfers seems to be presented accurately by the document furnished as Appendix F-3, taken from the *Property Transfer Investigation of Southern Properties*, prepared by Environmental Resource Management, Inc. in July 1993. Generally, with reference to **Map M-10**, the following transfers occurred prior to the Final Audit: 100 acres to the Department of Interior on 18 October 1950; 11,981 acres to the Department of Interior, Bureau of Indian Affairs, on 18 November 1950; 30,192 acres to the Department of Interior on 1 March 1960; and 9,502 acres to the Department of the Interior on 29 April 1928 by an Act of Congress. Subsequent clarifications and corrections have left within the boundary of the **FWDA** approximately 22,200 acres of land.

5.2 Present Ownership

Other than the properties given to other government agencies, the depot remains an inactive installation under ownership of the federal government.

5.3 Significant Past Ownership other than DOD

There have been no other past ownerships, other than agricultural ownerships, that can be considered significant from the perspective of causing potential environmental contamination.

6.0 SITE INSPECTION

35

6.1 General Procedures and Safety

To effectively accomplish the Archives Search Site Inspection task, a Safety and Health Plan (SSHP) is developed to insure the protection of the team performing the work. The plan describes requirements for team activities and operations while conducting the visual inspection of the site or area of concern for the presence or ordnance and/or explosive waste, including chemical warfare materials. A copy of the SSHP is presented as E-1.

6.2 Site Inspection - General

The following individuals participated in the first ASR site investigation of **Ft. Wingate Depot Activity**, NM.

Mr. Scott A. Barton
Mr. Gregg E. Kocher
Mr. Gerald V. Schwalbe

Photographs taken during the site visit are furnished in Appendix I and a copy of the formal trip report is included in Appendix E-2. Continuing analysis of information may require an additional site visit of a one or two day duration to verify information subsequently collected and/or confirmed ASR findings.

On Sunday 23 April 1995, the survey team departed from St. Louis Lambert Airport at approximately 1600 hrs., Central Standard Time, arriving at the Albuquerque, NM, Airport about 1730 hrs., Mountain Time. After renting a four wheel vehicle, they registered at the La Quinta Motor Inn near the airport and remained overnight. Early the next morning, Monday 24 April, the team drove to **Ft. Wingate** just outside of Gallop, NM, and began the site inspection task at about 0900 hrs.

6.3 Site Contacts

Upon arrival at the installation, the team initially contacted Mr. L. D. (Duke) Davis, senior caretaker (one of the four caretakers) assigned to **Ft. Wingate**. Mr. Davis later introduced the team to Mr. Mike Chavez, another caretaker, and to Mr. Fred Stephens, a local resident and former employee, who agreed to escort the team to the undeveloped southern property. Collected documents had indicated a burn area was once proposed for an area south of "J" Block. Mr. Davis mentioned that ERM Inc. and their sub-contractor, a team from UXB International Inc. (phone 505-488-6653/0177), were proceeding with a sweep of the unprotected area west of the Old Demolition Area, searching for "kick out" munitions from demilitarization operations. Mr. Tom Yancy was assigned as the Program Manager, Ordnance and Explosive Waste Services for UXB; and Mr. Tom Booker was in charge of the field operations. Their home office address is 14800 Conference Center Drive, Suite 100, Chantilly, Virginia 22021-3806, and phone number is 703-803-8904 (FAX Ext. 9355). Other UXB contacts presently at **Ft. Wingate** are Jim Kerr and Bill Dickson.

6.4 Other Property Uses and Miscellaneous Discussions

It was indicated by the caretakers that TPL Inc. had leased the 528 Complex and were taking flares apart. TPL also was using 48 igloos of "B" Block in the northern sector of the facility, which was a recent increase from the 19 igloos that they had previously been utilizing. The company is a private contractor under contract with the Army and Navy to destroy/demil up to 750 lb. bombs. 34

The Navajo Tribe uses Warehouses #12 and #13 for their food giveaway program. The caretakers also briefly mentioned the various entities and agencies with an interest in acquiring segments of the land that now comprises **FWDA**. This discussion is not addressed in further detail by this ASR site survey trip report.

6.5 Southern Area Site Survey

The team, accompanied by Mr. Fred Stephens, initiated the site survey task by departing the Administrative Area, proceeding through the guardhouse into the former operations and magazine/storage sectors. After driving through the installation, the area of interest was accessed via Gate 208, off of the South Patrol Road, adjacent to "J" Block (**Map M-6**). After exiting the depot secured sector, the team drove along a fairly rugged, wet red clay and slick (muddy), unimproved roadway to check the identified potential burn area. The twofold objective was to first search the area "proposed for munitions destruction through burning", and then continue to proceed southward and inspect locations once used for missile launching. The team drove to a relatively flat area in a valley, and then hiked back up the steep slope, searching areas adjacent to the roadway for any physical evidence of actual munitions burning, or disposal/demilitarization. This was followed by a search of the valley floor. One fairly level area in the valley was identified as one site that would be given consideration for a demil area. However, no evidence was found to suggest past demilitarization activity. It was generally felt that the proposed burn area was likely never developed, at least not in the general location identified on historic mapping. The team decided road conditions were not conducive to continuing through the southern sector to the missile launch sites. Thus, the team returned to the secured depot property via the same route entered. It was planned that on the following day the missile sites would be accessed from the east via the paved county roadway.

6.6 Depot East Side - General

The team then drove along East Range Patrol Road until reaching a position which Mr. Stephens pointed out was above one location where considerable munitions demolition had occurred in the past. The area is in FTR #1 (outside Gate 206). One overview photograph was taken of the relatively flat area designated as AREA #5 (Photo #1, Appendix I) . Continuing along East Patrol Road, the survey team observed a RR spur where demilitarized 3.5 inch rocket motors and warheads were piled on adjacent hardstand. Photographs were taken of the material (Photos #2-#4).

Earlier Mr. Davis had mentioned that in Functional Test Range (FTR) No. 1, UXB had found pieces of TNT stains in the ground west of the back side (?). He stated his belief this material was identified as having been manufactured somewhere in France. He also mentioned that according to Ike Lewis, TNT was once stored in the area of "A" Block. In investigating the area for cleanup, it was discovered the residue had sunk into the ground.

6.7 Burning, Demolition, and Detonation Areas

After dropping Mr. Stephens off at the office, the team used the rest of the workday surveying conditions at and in the vicinity, of the Open Burning/Open Demolition Area (OB/OD), AREA #10. This high profile contaminated location is in the southwest corner of **FWDA**. The team was escorted into the OB/OD area by caretaker Duke Davis.

Various and numerous ordnance debris was encountered within the fenced *OB/OD AREA* #10. Photographs (Photos #5 - #8, and #10, Appendix I) were taken of munitions debris along and immediately outside fenced areas, confirming previous UXO surveys and the established "Kick Out" boundary. Within the fenced area were found various parts of munitions, including M83 Butterfly bombs, 105mm fuzed howitzer projectiles, pieces of 20-lb. frag bombs and 75mm projectiles, small light-cased bombs, and other ordnance. Two noteworthy items identified and photographed were an apparent intact 105mm fuzed howitzer projectile jutting out of the side of one blow pit (Photo #12), and a possible intact M83 Butterfly bomb. Two large piles of inert ordnance debris were also inspected and photographed (Photos #13 and #14).

After completing a fairly extensive visual inspection of the grounds within the OB/OD area (Photos #9 and #11), the team left the fenced area and proceeded to AREAs #7 and #8. These locations are adjacent with Burning Area Road which provides access to Horse Valley. A decision had been previously reached not to inspect the fenced-in area of Horse Valley and properties outside the actual depot boundary as originally planned. This was because under contract the UXB Inc. UXO team was currently performing detailed inspections of the area. Their operations included the construction of an access bridge to properties outside the installation boundary. Conversations with representatives of UXB suggested that their findings would be available for incorporation into the ASR.

The team inspected the conditions at AREA #7 previously identified as "Three Mounds in area used for the demilitarization of WP Ordnance" (Photo #15). Residue is suspected of being buried in the mounds that were readily identified and positioned in the Aerial Photograph Interpretation task. The surrounding area was surveyed and a number of photographs were taken of OB/OD ordnance debris (Photos #16 -#18). Upon departure from this location a panoramic photograph was taken of the area identified as the "Old Burning Ground and Demolition Landfill Area". Rusted barrels were observed along the side slope of the arroyo adjacent to the access road (Photo #19). It was nearing 1700 hours, and time to depart the secured area of **FWDA**.

6.8 North, Northwest, and West Depot Sectors

After remaining overnight in Gallop, early on Tuesday 25 April, the team returned to **FWDA** and resumed their ASR site survey task. It was agreed to begin in the Northwest Sector near "A" Block and proceed southward along the west side of the depot. The first site inspected was the Sewage Treatment Plant (AREA #1). (Previously a UXO Survey Team had found 20mm AP-T and 40mm projectiles to below 6" of the surface in the vicinity of the document incinerator. This incinerator was originally used to destroy classified documents, but apparently was also used to destroy ammunition.) The St. Louis District team found and photographed three 20mm TP-T projectiles just outside of the incinerator (Photos #20 - #24, Appendix I). 36

After finishing at AREA #1, the team walked the area west of the RR spur where ground disturbances had been noted during the Aerial Photographic Interpretation Task. Nothing constituting ordnance/munitions debris was found on the ground surface during this surface search. Photos were taken of banding, concrete gutters, and other debris suggesting some disposal of junk by burial may have historically occurred west of and along the RR spur Photos 26 -#29). The team also inspected a number of apparent ground disturbances identified during Aerial Photo Interpretation in "Igloo Blocks A & B". These disturbances were identified as Y-Site Storage areas with no OEW found on the surface (Photo #30). The team then proceeded along the West Patrol Road and observed a number of other previously identified historic ground disturbances along the west boundary, but likewise found no evidence of OEW. Near the intersection of West Patrol Road with Demil Road, (location is immediately north of "Kick Out" boundary), the team checked the surface conditions of ground disturbance identified as Item 19 of the Photo Interpretation. This was suspected of being a potential OB site. The location did appear to have been graded. Field data was collected on an item identified as a packing container lid from a 37mm gun cartridge (Photo #31 and #32).

Next the team inspected a cleared area west of "H" Block identified as Group C Disposal Area. A recently active rifle range was found in the North part of the area of concern (Photo #33). Although the north part of area was covered fairly extensively, in hindsight, it was believed additional time should have been spent surveying the southern part of the tract. The team then proceeded to locate and photograph two piles of Rocket Fins disposed in a drainage area previously identified as AREA #13 (Photo 34). Visits to the west and northwest of "C" Block, along a ridgeline, to observe ground disturbances identified from Aerial Photos did not produce any surface evidence of OEW contamination. After finishing in this area, the team drove just north of "H" Block and surveyed another area of concern (Photo Interpretation Item 15). It did appear some facility or operation occurred at this location. The initial reaction, based upon observation of the location, was that it did not constitute a potential site for further OEW investigations (Photo #35).

6.9 Operations and Missile Launch Sites

It was approaching 1200 hrs. and a lunch break. However, before leaving the **FWDA**, the Ammunition Surveillance Workshop (Bldg. 536), the Remnants of the Former Deactivation

Furnace (Bldg. 530-AREA #14), Bldg. 537, the disposal area adjacent to the Deactivation Furnace (AREA #3), and the TNT Wash-Out leaching Beds (AREA #2) were observed and photographed. A piece of a 3.5" practice rocket warhead was found just outside the rear of the building. Other miscellaneous pieces of ordnance-related scrap were also found. Ordnance debris was found on the surface of AREA #3 (Photos #36 - #43, Appendix I).

After lunch, the team continued its site survey proceeding with caretaker Mike Chavez as escort to the past Missile Launch facilities located in the southeast corner of the property. Surveyed was an unused missile launch pad, the Ballistic Missile Site (BMS) launch pad and surrounding area, and the Pershing Missile Site near the developed picnic area (Arbitrarily Assign were AREA #s 17 A, B, C). Photographs were taken at the various locations (Photos #44 - #46). The consensus was no concern exists for OEW contamination from past missile operations. The team returned to the depot operation and storage areas at about 1500 hrs. and continued the inspection of areas of concern in the North Central and North East depot sectors.

6.10 Function Test Ranges and East Depot Sector

During the late afternoon, the TNT Wash-Out Facility in the North Central Section (Photo #47. Appendix I) and the Function Test Ranges (FTRs) were surveyed. Rocket fins were located in the North Central Area of FTR 2/3 Range (Photo #48 and #49), a pistol range was located in the area arbitrarily assigned as AREA #18 (Photo #50), and ordnance debris (105mm smoke canisters and bases from 75mm projectiles) was located in the vicinity of a mound located in FTR #1 AREA 15 (Photos #51 and 52). Since it was nearing 1700 hrs., the end of the work day for caretakers and private contractor security at **FWDA**, it was necessary to conclude the site survey.

Although nearly all the areas of interest or concern had been at least partially viewed, it was still believed an additional site survey may prove valuable at a later date. Past experience on a similar study showed that after consideration was given to the collected information, it became necessary to return and confirm the compiled data and/or view the site conditions in the areas of concern. If needed, a second site survey trip will be arranged during the draft ASR review period.

The team had committed to perform the resurvey of the Mt. Campbell Rifle Range in Fresno, CA, on the following day. At about 1500 hrs, the team departed **FWDA** and drove to Albuquerque, arriving at about 2130 hrs. After remaining overnight they departed Albuquerque at about 0600 hrs. Wednesday, 26 April 1995.

6.11 Second Site Survey

The following individuals participated in a second ASR site investigation of **FWDA** on 10 - 11 July 95.

Mr. Scott A. Barton
Mr. Gregg E. Kocher
Mr. Gerald V. Schwalbe

Photographs taken during this visit have also been included in Appendix I and a copy of the formal trip report in Appendix E-2.

38

On Monday 10 Jul 95, the survey team departed from St. Louis Lambert Airport at approximately 0950 hrs (Central Time) arriving at the Albuquerque, NM, Airport at about 1125 hrs (Mountain Time). After picking-up a four wheel rental vehicle, the team drove to Gallup, NM arriving at approximately 1530 hrs (Mountain Time). The team drove to **Ft. Wingate Depot Activity,** but where unable to make contact with Mr. L.D. "Duke" Davis, senior caretaker. Messrs Barton, Kocher, and Schwalbe remained overnight in Gallup, NM.

Upon arrival at the installation at 0700 hrs, 11 Jul 95, the team contacted Mr. L. D. (Duke) Davis, senior caretaker, and he signed-out the necessary keys. The team then proceeded to the Old Demolition Ground area in the Horse Valley fenced-in area. Pieces of bomb fragments were located at GPS N 35° 26' 09.6" W 108° 37' 36.0", and N 35° 26' 10.5" W 108° 37' 30.3"; and a practice rocket fuze was found at the south end of the old Demolition Area at GPS N 35° 26' 13.5" W 108° 37' 35.6". Other identified and non-identified items were also photographed (Photos #53 - #57, Appendix I). After surveying the site by foot and taking the photographs, the team proceeded to Site No. 9, the Dump Pile.

The Arroyo, located north of the "old" Demo Ground Area and south of Site No. 9, the Dump Pile, contained various ordnance debris such as: 37mm M51-series projectiles, AN-M120 nose fuzes, 81mm mortar tail boom, and 14 inch Navy Gun projectile (Photos #58 - #64). After surveying the Arroyo and taking several photographs of the various ordnance items, the team first drove to the Group C Disposal Area and surveyed the southern sector which had not been looked at on the first trip. At this location the team located no signs of ordnance or explosives (Photo # 65).

The team then proceeded to the FTR #1 which had not been completely investigated during the first trip on 24 -25 April 1995. Historically, FTR #1 area has been used as a parachute drop zone for reserve training exercises. The team surveyed the site and encountered primer tubes and other unidentifiable debris (Photos #66 and #67). After finishing the survey, the team returned the keys to Mr. Davis and then drove back to Albuquerque for a return flight back to St. Louis.

7.0 EVALUATION OF ORDNANCE PRESENCE

36

7.1 General Procedures

Numerous documents were collected during the archives research, supplemented by interviews and a site survey, that indicate there is definitely ordnance and explosives contamination on **FWDA**. This contamination is from activities associated with the storage and maintenance, transportation, general depot missions, but primarily from the demilitarization and disposal of outdated and retired munitions. This activity was one important mission during the more recent history after WW II of the installation.

A RAC score of "1" is assigned to the entire facility (Appendix L).

Note: In the following ordnance evaluation, specific locations, where it was believed appropriate, were verified using a Trimble Navigation "Scout" hand-held GPS instrument using WGS-84 mapping datum. These locations are identified by a ten-digit Military Grid Reference System coordinate and Latitude/Longitude. These readings are an average of 50 position fixes. All other locations are derived from various maps and photographs. The abbreviation "CoM" stands for center-of-mass, and is used as a general location for large areas. The specific locations of known and potential OEW contamination addressed in the following paragraphs are plotted on **Maps M-3** and **M-4**.

7.2 Overall OEW Site Evaluation

Ammunition experiments were conducted at **FWDA** on a variety of ordnance. One experiment involved burying aircraft bombs. Some 938 AN-M64A1 500-lb. GP bombs were buried. The exact location of this experiment is not known, however, a summary of depot activities for 1954 states that "Buried bombs in storage test were removed and demilitarized in May 1954".

Another experiment involved burning rows of 57mm and 75mm APC-T projectiles, 10,000 at a time. Again, it is not known where this activity took place, but most likely was conducted in the old burning grounds.

One reference to toxic chemical munitions came from one of the interviewees, who stated that 155mm rounds filled with mustard were temporarily stored in area H for shipment to Pueblo. Apparently, no demilitarization of chemical-filed munitions was performed at **Fort Wingate**.

With reference to **Maps M-3** and **M-4**, the following paragraphs present discussions of site specific evaluations and recommendations for the locations that are either confirmed or suspect of having UXO and OEW present on the site. A List of Ordnance known to have been stored and/or demilitarized at FWDA is presented as **TABLE 7-1**, and the Areas of Concern (AOCs) are listed in **TABLE 7-2**.

7.3 Site Specific Evaluations/Recommendations

7.3.1 Site #1, Sewage Treatment Plant (document incinerator)

40

a. Discussion: The UXO Survey found 20mm AP-T and 40mm projectiles to below 6" of the surface in the vicinity of the document incinerator. This incinerator was originally used to destroy classified documents, but apparently was also used to destroy ammunition. 7,930 live ordnance items were removed during the survey (All but 2 were 20mm).

During a site investigation conducted by St. Louis District personnel, three 20mm TP-T projectiles were found just outside of the incinerator. They appeared to have had the tracer element burned out.

b. Recommendation: The area immediately adjacent to the incinerator building be swept again, as well as having the inside of the incinerator cleaned out in the event any projectiles remain inside.

7.3.2 Site #2, Building 503 - TNT Washout Facility

a. Discussion: The building contains equipment contaminated with TNT. The building structure may also be contaminated as well as the nearby leaching beds. These facilities are located south of the administration area. Three leaching beds have been associated with the ammunition washout operation. Beginning in 1949, munitions were received in Bldg. 500, where they were unpacked, broken down, and transported to Bldg. 503. A hot water washout operation then took place. The munitions contained TNT, RDX, or Tritinol, and the resulting explosive slurry was pumped into a storage and drying tank to eventually be shipped to various ammunition plants for reuse.

The washout facility and leaching beds were used until 1967 when the operation shut down. The bottom soil of the beds was removed and burned at the burning ground (USATHAMA, 1980). However, soil from the leaching beds was analyzed in 1981 and found to contain 2,4,6-TNT and 1,3,5-TNB. Even though most of the soil was removed, contaminants are still present (USATHAMA, 28 Aug 92).

No obvious contamination was observed during the site survey by St. Louis District.

b. Recommendation: Soil borings and sediment samples should be collected and analyzed for the full range of volatile organics, residues and inorganics, to include nitrates, and total phosphorus.

7.3.3 Site #3, Deactivation Furnace Area

a. Discussion: The Deactivation Furnace was located in Bldg 530, in the southern part of the Workshop Area. Currently, the shell of the building, the former furnace foundation, and several associated concrete areas remain. Past operations included the melting, separation, and recovery of lead, brass, and steel from cartridges and other

munitions. Modifications were made to this furnace in the late 1970's to burn elemental phosphorus from WP rounds to produce commercially-marketable phosphoric acid. From 1982 until 1986, WP was removed and burned to produce phosphorus pentoxide. That was sent through a water scrubbing system to produce phosphoric acid, which was sold for the production of fertilizer. When the operation was discontinued, the furnace was dismantled by AMCCOM, analyzed for hazardous contaminants and disposed of by the DRMO (USATHAMA, 28 Aug 92).

Forty-seven live ordnance items were removed from the surface, and more are suspected below the surface. Although not specified in the UXO Survey report, these are believed to have been 20mm, 40mm, and 57mm projectiles.

A piece of a 3.5" practice rocket warhead was found just outside the rear of the building during the recent site survey. Other miscellaneous pieces of ordnance-related scrap, such as nose plugs, were also found.

b. Recommendation: This area should be swept for UXO and soil and sediment samples collected. Analyses should be for explosives, nitrates, total phosphorus, TAL inorganics and Ph.

7.3.4 Site #4, Functional Test Ranges (FTR) 2/3

a. Discussion: Flare and signal grenades were tested here in the late 1950's. Piles of fins from 5" rockets were found in this area [extending for 150 meters southwest from YE 21731 32017; N 35° 30' 25.1", W 108° 33' 18.6"].

b. Recommendation: This is a very large area which probably has little actual OEW contamination. Recommend that additional searches be conducted to define the extent of contamination, if any. The only evidence observed was the pile of rocket fins, which are scrap.

7.3.5 Site #5, FTR 1 (all areas except Site #15)

a. Discussion: High explosive 2.75" rockets and 4.2" mortar rounds were tested here between 1960 and 1967. Ordnance debris was found in an arroyo and several burn areas may contain residue or UXO. Bases from 75mm HC smoke projectiles and 105mm smoke canisters were found at YE 18906 27674; N 35° 28'06.6", W 108° 35' 14.9". A pile of burned primer tubes lies at YE 18573 26989; N 35° 27' 44.6", W 108° 35' 28.8". Other burn piles contain unknown ordnance debris.

b. Recommendation: Again, although this a huge tract of land, only a few areas are believed to be contaminated. Recommend that these areas be further defined and swept clear of OEW.

7.3.6 Site #6, Old Open Burn/Open Detonation (OB/OD)

a. Discussion: This area was used to burn explosives and explosive-contaminated materials beginning in 1948. It was certified clear and closed in 1955. Buried projectiles, possible WP, and explosive residue could be expected at this location. During our site visit, numerous large chunks of fragmented munitions were found in the vicinity of YE 15436 23984; N 35° 26' 09.6", W 108° 37' 36.0". Part of a butterfly bomb was located at YE 15580 24015; N 35° 26' 10.5", W 108° 37' 30.3". Fragmentation from small projectiles and a 3.5" rocket fuze (possibly M404 base detonating) were found at YE 15443 24103; N 35° 26' 13.5", W 108° 37' 35.6". 42

b. Recommendation: From the 3 WP mounds (Site #7), extending southward for perhaps half a mile, there is a valley littered with debris. This area should be swept and cleared on both sides of the road.

7.3.7 Site #7, Three (3) White Phosphorus Mounds

a. Discussion: These mounds may contain white phosphorus according to interviews conducted for a previous report. Scattered around each of these mounds are ordnance-related parts, chunks of fragmentation, smoke canisters, bomb safety switch assemblies and other debris.

b. Recommendation: At one time, a backhoe was brought in to dig into one of the mounds to determine its contents. Based upon the recent inspection, it did not appear that the digging went deep enough to determine if OEW or munitions debris was buried at the location. These mounds should be checked for the presence of WP and the surrounding area (approximately 5-10 acres) should be cleared of OEW and ordnance-related scrap.

7.3.8 Site #8, Arroyo in Fenced-up Horse Valley

a. Discussion: Much of the debris is ordnance-related scrap such as banding metal, ammunition box hinges and the like. It appears as though the debris was bulldozed into the arroyo or used as landfill. At a point adjacent to site #9, a large piece of a projectile believed to be a 14" round was found, as well as piles of 37mm APC-T projectiles marked M51B1, M51B2, and M51B3. This area is in the vicinity of YE 15900 25032; N 35° 26' 43.2", W 108° 37' 16.6".

b. Recommendation: Clearing this area will be difficult due to the rugged terrain and quantities of fill material involved. Perhaps, further sampling is necessary to determine the nature of the contamination, if any.

7.3.9 Site #9, Dump Pile

a. Discussion: This area may contain some ordnance. Exact types are not known. Only pieces of rusty hinges, nails and metal plates were found.

b. Recommendation: This area should be cleared as part of the overall clearance of the UXO kickout area (see below).

43

7.3.10 **Site #10, Current OB/OD** (includes approximately 1,200 acres surrounding the OB/OD grounds called the "UXO kickout area)

a. Discussion: This area has been in use since 1955. Ten demolition pads existed at this location in 1981. The range limit was 10,000 lbs. subsurface and 5,000 lbs. for surface demolition shots. The OB/OD grounds contain a lot of ordnance debris, scrap metal and possible TNT contamination.

One of the blow pits was observed to have an apparently intact 105mm fuzed howitzer projectile jutting out of the side as well as a possible intact M83 Butterfly bomb at YE 16081 23935; N 35° 26' 07.5", W 108° 37' 10.5".

Numerous empty 20-lb. frag bombs were scattered around the southern edge of Site 10 as well as a rocky slope with a junkyard of ordnance items (no live munitions, but fuze parts, fragmentation, etc.) at YE 15782 24027; N 35° 26' 10.7", W 108° 37' 22.2".

There are two large piles of inerted ordnance which contain everything from 4.5" Inca rocket warheads, JATO bottles, 75mm projectiles to small light-cased bombs.

b. Recommendation: This area is still heavily contaminated with scrap metal and ordnance-related debris. The terrain is rugged and will be difficult to clear. Soil samples from the blow pits should be tested for explosive residue.

7.3.11 **Site #11, Group C Disposal Area**

a. Discussion: This site is in an arroyo south of Igloo area C and west of area H. Not much is known about past uses.

An expended light-cased pyrotechnic signal (type unknown) was found in the flat area, as well as bits of metal from other munitions.

b. Recommendation: Soil and sediment samples should be taken for explosives analysis. The flat area where actual disposal operations took place may be quite large, perhaps 25-30 acres.

7.3.12 **Site #12, Dug Out Area**

a. Discussion: In an open field near the railroad siding, a pile of non-ordnance-related scrap (carbon batteries, jars, etc.) was found at YE 18019 33258; N 35° 31 08.4", W 108° 37' 10.5". No OEW or ordnance-related scrap was found.

b. Recommendation: The location of this site was pinpointed by the survey team, but no OEW was found. No further action is recommended, unless another party has

actually observed OEW in this area.

7.3.13 **Site #13, Drainage Ditch**

a. Discussion: A pile of 5" aircraft rocket fins is located at the end of a large drainage ditch. These fins appear to have originally been painted black. No other signs of OEW were located in or around the ditch.

b. Recommendation: Haul away the scrap.

7.3.14 **Site #14, Deactivation Furnace**

a. Discussion: This site represents only the furnace itself (see Site #3).

b. Recommendation: See Site #3.

7.3.15 **Site #15, FTR 1**

a. Discussion: At this location, 105mm smoke canisters and bases from 75mm (Believed to be M89 75mm HC Smoke Rounds) projectiles were found near a man-made berm [YE 18906 27674; N 35° 28' 06.6", W 108° 35' 14.9"].

b. Recommendation: This area is fairly heavily contaminated with ordnance-related scrap, and possibly with UXO. It should be cleared of all OEW and scrap metal.

7.3.16 **Site #16*, Proposed Burning Ground**

a. Discussion: The road leading to this site is extremely hazardous when the clay is slick from rain or snow. The hilltop and valley areas were walked with no signs of any OEW.

b. Recommendation: It is our opinion that no burning ground was ever placed in this area, so no further action is recommended.

7.3.17 **Site #17*, Ballistic Missile Launch Pads** (3 Areas: A, B, C)

a. Discussion: Sergeant and Pershing missiles were launched from these sites for impact at White Sands Missile Range. From October 1963 to February 1964, 14 Pershing missiles were launched. One individual interviewed, who was the facility engineer at **Fort Wingate** for 18 years, stated that he heard two Pershing missile rocket motors were buried a few meters south of the BMS launch pad (17b), but he didn't believe it was so.

b. Recommendation: There is little chance of any OEW being present from missile launch activities; however, the areas immediately surrounding the pads should be checked for contamination from fuels, oxidizers, and other propellants. Certainly, no OEW was encountered during the site visit.

7.3.18 Site #18*, Pistol Range

45

a. Discussion: This range is still in good condition and may still be in use. Spent 5.56mm cartridge cases were found, so some rifle shooting has been done as well.

b. Recommendation: Unless lead from the bullets is a concern, no further action is recommended.

7.3.19 Site #19*, Rifle Range

a. Discussion: There is a range to the north of the Group C Disposal Area [YE 16719 27481; N 35° 28' 02.0", W 108° 36' 41.8"] where the team was told a joint task force conducted drug interdiction training with local law enforcement agencies. There are PVC tubes in the ground where a mock building was erected for live fire training in building entry. Spent cartridge cases included commercial 9mm Parabellum, 10mm and one military 5.56mm case. One live 5.56mm blank round was also found.

b. Recommendation: It is not known if this will remain a range for law enforcement use. Lead contamination is probably the only concern here.

* These sites added from archival research; not found in UXO Survey document

7.4 Other Locations Investigated

a. A field about 600 meters northwest of gate 206 [YE 16314 26357; N 35° 27' 25.9", W 108° 36' 58.9"] yielded a metal lid from a packing container for a 37mm Gun cartridge. A banding clip was also found, but no other evidence of OEW was found.

b. A large concrete pad near D-block has thousands of components from 3.5" practice rockets sitting in piles. All components appear to be inert, but the scrap should be removed.

7.5 Low-level Radioactivity

In 1989, two igloos in the magazine area reportedly used by the Atomic Energy Commission during the 1940's were surveyed for radioactivity. The results showed no elevated levels of radiation. The Department of Energy currently stores equipment in magazine J-309. According to available information, there are no radioactive materials stored there (USATHAMA, 28 Aug 92). There is no further information which indicates a hazard from radionuclides.

TABLE 7-1

LIST OF ORDNANCE

Munitions known to have been stored or demilitarized at **Fort Wingate**

PROJECTILES

20mm HEI
37mm APC-T, M51
37mm HE, M63
40mm HE-T, MK27
57mm Gun, APC-T, M86
57mm RR, HE, M306A1
60mm HE, M49A2 w/ PD Fuze M52
3" APHE
75mm Gun, APC-T, M61
75mm Gun, HE, T50E2
75mm WP, M64
75mm Howitzer, HE, M48A1
75mm HE, M41A1 w/ PD Fuze M48
76mm APC-T, M62A1
81mm HE, M43A1
81mm WP, M57 w/ PD Fuze M52A2
90mm Gun, HE, M71
90mm Gun, HE-T, T91
90mm Gun, APC-T, M82 w/ BD Fuze M68
105mm Howitzer, WP, M60
105mm Smoke, HC, M84
105mm WP, T19E2 (mortar)
4.2" HE, M329 w/ PD M51A4
4.5" Prop Charge (rocket?)
120mm Prop Charge
155mm Howitzer, HE, M101
155mm WP, M110
155mm Prop Charge
6" Gun Prop Charge
8" Howitzer, HE, M103
240mm

TABLE 7-1

4/

LIST OF ORDNANCE (CONT'D)

BOMBS

3-lb. Demolition
8-lb. Drift Signal
20-lb. Frag
23-lb. Frag, TNT, M72
90-lb. Frag, M82
100-lb. GP
100-lb. Frag, M1A1
250-lb. GP
500-lb. GP, AN-M64
500-lb. Demolition, M43
500-lb. Frag, M26
750-lb. Demolition
1,000-lb. GP, M44
1,000-lb. SAP, AN-M59A1
2,000-lb. GP, AN-M66
2,000-lb. GP, AN-M34
2,000-lb. LC, T9
10,000-lb. Demolition, T56E2
M83 "Butterfly"
BLU-3
BLU-4
Firebomb (napalm)

OTHER MUNITIONS

2.75" Rocket
3.25" Target Rocket
3.5" Rocket, WP, M30
3.5" Rocket, Practice, M29A2
4.5" Rocket. HE, T22
5" Rocket
Nike Missile
Mine, AP, M2, M2A1, M2A4, M3
Mine, AT, M15
Mine, M6
Hand Grenade, Frag, M26
TNT, bulk
Rocket-propelled grenade, PG-9
Trip Flare, M49
Fuze, Flare, Mech Time, M11
Commercial (police) gas bomb (DM)

TABLE 7-2

SPECIFIC AREAS OF CONCERN (AOCs)

48

(Site # corresponds to those in the "Briefing on UXO Survey Activities")

- Site #1 - Sewage Treatment Plant (document incinerator)
- Site #2 - Bldg. 503, TNT Washout area.
- Site #3 - Former Deactivation Furnace.
- Site #4 - Functional Test Ranges (FTR) 2/3.
- Site #5 - FTR 1
- Site #6 - Old open burn/open demolition area (OB/OD)
- Site #7 - 3 white phosphorus (WP) mounds
- Site #8 - Arroyo in Fenced-up Horse Valley
- Site #9 - Dump Pile
- Site #10 - Current OB/OD area [includes approximately 1,200 acres surrounding the OD/OD grounds called the "UXO kickout area"].
- Site #11 - Group C Disposal Area.
- Site #12 - Dug Out Area
- Site #13 - Drainage Ditch
- Site #14 - Deactivation Furnace Area
- Site #15 - FTR 1
- Site #16* - Proposed Burning Ground (from 1958 map)
- Site #17* - Ballistic Missile Launch Pads (3 areas)
- Site #18* - Pistol Range
- Site #19* - Rifle Range

* added from Archives Search Report; not found in UXO Survey document

8.0 TECHNICAL DATA OF ORDNANCE AND EXPLOSIVES

8.1 End Item Technical Data

A section of data sheets of unusual or especially hazardous ordnance is included in Appendix C.

8.2 Other

Fort Wingate Depot Activity had a vast array of munitions stored and demilitarized over the lifetime of the depot's operation. Much of the ordnance-related material encountered today is parts, fragmentation, or expended or burned-out munitions. However, ordnance in an unknown (possibly fuzed and armed) condition has been noted during site investigations by the ASR team, as well as during past site surveys, sweeps, and removals by contractors..

9.0 CONCLUSIONS AND RECOMMENDATIONS

50

9.1 Summary of Recommendations

The Risk Assessment Code Procedure Form has been prepared for **Ft. Wingate Depot Activity**, New Mexico, and is included as Appendix L. Based upon the data collected, site investigations, interviews with current and former depot employees, a score of RAC 1 has been determined for the installation.

9.2 Preliminary Assessment Actions

The individual areas of concern recommendations have been included for the convenience of the reader along with the evaluation of the specific location being addressed on **FWDA** (reference to discussions contained in paragraph **7.0, *EVALUATION OF ORDNANCE PRESENCE***).